Subject:

(310242)

Database Management Systems

(DBMS)

Scheme

Theory: DBMS

- **Teaching Scheme:** Lectures 3 Hrs/Week
- **Examination Scheme:**
  - In Semester Assessment: 30 Marks
  - End Semester Assessment: 70 Marks

Practical: DBMS Laboratory

- **Teaching Scheme:** Practical: 4 Hrs/Week
- **Examination Scheme:**
  - Practical : 50 Marks
  - Term Work: 25 Marks

Course Objectives:

- To understand the fundamental concepts of database management.

These concepts include aspects of database design, database languages, and database-system implementation

- To use Structured Query Language (SQL) and design relational database.

These concepts helps us to design good database and tell us how to handle it.

- To illustrate the concept of Transaction , Query processing and various Database Architectures.

These concepts explain various database architectures and query processing.

- To use scalable general purpose databases to handle big data.

These concepts explain how to handle big data.

Course Outcomes:

On completion of the course, student will be able to–

- summarize fundamental concepts of database management.
- apply SQL for Relational database management system and normalization techniques to normalize the database .
- analyze transaction management and classify various Database Architectures
- apply non-relational database techniques for storing and processing large volumes of unstructured data.

Contents of DBMS

- **Unit I:** Introduction to Databases: 07 Hrs
- **Unit II:** SQL and PL/SQL: 07 Hrs
- **Unit III:** Relational Database Design: 08 Hrs
- **Unit IV:** Database Transactions and Query Processing: 08Hrs
- **Unit V:** Parallel and Distributed Databases: 07Hrs
- **Unit VI:** NoSQL Database: 08Hrs

Books

Text Books:

- Abraham Silberschatz, Henry Korth, S.Sudarshan,"Database System concepts",5th Edition ,McGraw Hill International Edition.
- Connally T, Begg C., "Database Systems", Pearson Education, ISBN 81-7808-861-4
- Pramod J. Sadalage and Martin Fowler, “NoSQL Distilled”, Addison Wesley, ISBN-10: 0321826620, ISBN-13: 978-0321826626

Reference Books:

1. C J Date, “An Introduction to Database Systems”, Addison-Wesley, ISBN: 0201144719
2. S.K.Singh, “Database Systems : Concepts, Design and Application”, Pearson, Education,ISBN 978-81-317-6092-5
3. Kristina Chodorow, Michael Dirolf, “MangoDB: The Definitive Guide” ,O’Reilly Publications, ISBN: 978-1-449-34468-9.
4. Adam Fowler, “NoSQL For Dummies”, John Wiley & Sons, ISBN-1118905628
5. Kevin Roebuck, “Storing and Managing Big Data - NoSQL, HADOOP and More”, Emereopty Limited, ISBN: 1743045743, 9781743045749
6. Joy A. Kreibich, “Using SQLite”, O'REILLY, ISBN: 13:978-93-5110-934-1
7. Garrett Grolemund, “Hands-on Programming with R”, O'REILLY, ISBN : 13:978-93-5110-728-6

Unit I

Introduction to Databases

Definition – Data

- **Data** is raw, unorganized facts that need to be processed.
- Data can be something simple and seemingly random and useless until it is organized.
- **Example:** Each student's test score is one piece of data.
- "Data" comes from a singular Latin word, datum, which originally meant "something given."
- Over time "data" has become the plural of datum.

Definition–Information

- When data is processed, organized, structured or presented in a given context so as to make it useful, it is called **information.**
- Information is the **processed data** on which decisions and actions are based.
- **Example:** The average score of a class or of the entire school is information that can be derived from the given data.

Definition – DBMS

- A **database** is an organized collection of data. It is the collection of tables, queries, reports, views and other objects.
- Database contains information's relevant to enterprise.
- **DBMS(Database Management System)** is a collection of interrelated data and a set of programs to access those data.
- It provides a way to store and retrieve database information in convenient and efficient manner.

Definition – DBMS Contd…

- **Management** of data involves:
  - Defining structures for storage of information
  - Providing mechanisms for the manipulation of information.
  - Ensure the safety of the information stored, despite system crashes or attempts at unauthorized access.
  - If data are to be shared among several users, the system must avoid possible anomalous results.
- Well-known DBMSs include MySQL, PostgreSQL, Microsoft SQL Server, Oracle, Sybase and IBM DB2.

Application of DBMS

- Banking
- Airlines
- Universities
- Credit card transactions
- Telecommunication
- Finance
- Sales
- Manufacturing
- Human resources